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REMARKS

Claims 1-18 are pending and presented for review. Reconsideration of the rejections of these claims and allowance of the application are respectfully requested in light of the remarks which follow.

A. Rejection Under §112, first paragraph

Claims 1-18 stand rejected under 35 USC §112, first paragraph, as allegedly not being enabled by the specification as originally filed.

First, the Examiner contends that the specification does not disclose the necessary structure for generating a horizontal force perpendicular to a longitudinal axis of the device so as to cause a yawing movement. The Examiner contends that the mere claiming of two eccentric weights that can act in opposite directions is insufficient to enable this function. This rejection is respectfully traversed. While it is true that the application does not claim or even disclose every detail of any particular embodiment of a device steered in the manner claimed, the disclosure, coupled with the knowledge of one skilled in the art, provides more than ample information to permit one skilled in the art of vibration plates to make and use the invention without undue experimentation.

The fact that some details of the preferred embodiment are not disclosed is irrelevant where, as here, those details are known by or can be easily produced by those skilled in the art. Indeed, "a patent need not teach, and preferably omits, what is well-known in the art." MPEP §2164.01, citing, e.g., *In re Buchner*, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991). In the present case, applicant does not profess to be the first to develop a steerable compaction plate, i.e., one that is steered by altering its vibration characteristics to impose side-to-side or yawing forces on the machine. Steerable compaction plates are well known. For example,

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the application states that it is known to steer a compaction plate by altering the relative phase relationship of two eccentric weights on an unbalanced exciter:

"Soil compaction devices of this type, for example a vibration plate with the type designation "Wacker DPU 7060", are well known and have proven themselves in practice to be excellent, especially in compacting mainly coarse-grained or weakly agglomerating soils. Here, an oscillator driven by a motor is attached to a soil contact plate and sets the soil contact plate into vertical oscillation which then is transferred to the soil. The oscillation produced usually has a constant or even a variable horizontal force component that provides a forward, backward or steering motion of the vibration plate. In the process, the horizontal motion of the vibration plate is supported by the operator through a center guide post or a guide handle. At the center guide post, an operating lever can be provided that is coupled to hydraulic valves, with the help of which the direction of motion of the vibration plate can be adjusted using a hydraulic positioning system. Another known method is to perform the steering and direction functions using a remote control unit. In these remote controlled plates, the steering is commonly done by providing the oscillator with separate eccentric weights that are adjusted so as to work against one another and produce a circular or yawing motion of the machine"

Specification, page 1, line 7-21. (Emphasis added)

The DPU 7060 machine referenced above has been commercially available since 1979. Applicant states in the specification that machines of this type are well known to those skilled in the art. That statement, being under cover of the declaration filed with the application, must be accepted as true unless the Examiner cites a reasonable basis for doubting it. *In re Chu*, 36 USPQ2d 1089 (Fed. Cir. 1995). He has not done so. The manner in which it is steered therefore also is well known to those skilled in the art. It has also been documented. Specifically, Figure III of the technical bulletin, attached hereto as Appendix A, shows the control of the phase relationship of the two eccentric weights on one shaft of the machine (the lower shaft in the figures) in one manner to achieve left hand steering, and

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Figure IV shows control of the phase relationship of those weights in another manner to achieve right hand steering.

The same type of control is disclosed in the present application when describing the operation of the preferred embodiment:

"In a known fashion, the positioning unit changes the position or phase of the rotating eccentric masses with respect to one another, whereupon the horizontal component of the resultant overall force changes and a change in the directional behavior of the vibration plate is produced."

Page 2, lines 19-22.

"The shafts 1, 2 as well as the eccentric masses 3, 4 can each be separated in the axial direction so as to produce a yawing moment – at the right phase relationship – which makes the vibration plate rotate at a point or – with simultaneous forward motion – travel about a curved radius.

The change of the phase relationship of the shafts 1, 2 to one another as well as the phase relationship of two eccentric masses on one shaft is done using a known positioning unit in which suitable control elements, not shown, are shifted by means of a hydraulic system 6, which is also a part of the positioning unit. The fluid stream in the hydraulic system 6 can be influenced in various ways according to the state of the technology."

Page 3, line 23 through page 4, line 2.

If, as shown in Fig. 2, two independently moving control handles 8 are provided, not only can the direction of travel (forward, backward, standstill) of the vibration plate be adjusted, but also a steering or circular motion can be accomplished, provide the oscillator is so equipped.

Page 5, line 32 through page 6, line 1.

In summary, the novelty of the present invention does not lie in the ability to steer a vibration plate through the adjustment of its oscillator's eccentric weights, e.g., through the control of a positioning unit, such as one containing hydraulic valves. That concept is well

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known. What *is* new is the control of such a positioning unit by electronically sensing the position of an operator element such as a joystick or a pair of levers and generating a corresponding signal that is transmitted to the positioning unit to effect the desired steering and directional control functions. Applicant submits that one skilled in the art, reading the passages quoted above in conjunction with his or her own knowledge of the art, would be more than capable of making and using a machine meeting the limitations of the claims without undue experimentation. Withdrawal of this rejection is believed to be in order and is respectfully requested.

The Examiner also indicates that he is unclear as to how the positioning unit controls the direction of travel and steers the device. In addition, he questions what elements constitute a "positioning unit" and, of those elements, which one controls the direction of travel and which ones control the steering of the device. The answers to these questions are provided by the text of the application, which identifies an embodiment of the "positioning unit" one as including hydraulic valves that are opened and closed to provide the desired axial shift. The eccentric shifts in response to valve actuation to achieve the desired steering function and/or directional control functions. As indicated above and as stated in the application text, positioning units of this type are well known to those skilled in the art.

The invention differs from prior machines of this type only in that the positioning unit is servo controlled using the claimed operator element and sensor unit on the machine rather than via a remote control or by mechanical connections on the machine. In the embodiment described in the specification, the positioning unit is activated by a receiver unit 9 that is provided on the compaction plate and that receives radio infrared signals from a sending unit. The signals are converted in the receiver unit 9 to actuate electromagnetic valves provided in the hydraulic system 6 through the hydraulic system controller 10. See, e.g., page 4, lines 9-

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13. More specifically, the sensor unit 11 converts the detected position of the operator element 8 into an electronic signal that is fed to the hydraulic system controller 10. That signal is then electromagnetically converted, e.g., via an electromagnetic control element, to a signal that acts on the hydraulic system 6 to influence the phase relationship of shafts 1, 2 and the eccentric weights 3, 4 of the oscillator in a manner that is, *per se*, well known. See page 5, lines 5-8. Withdrawal of the rejection under 35 USC §112, first paragraph, therefore is believed to be in order and is respectfully requested.

B. Rejections Based on Prior Art

All claims stand rejected under 35 USC §103(a) as being unpatentable over the prior art. Specifically:

- Claims 1, 3-5, 13, 15-17 stand rejected as being obvious over
 Waschulewski in view of Crum et al.;
- Claims 1, 3-5, and 8 stand rejected as being obvious over *Stoecker* in view of *Ishibashi et al.*;
- Claims 2, 10, and 11 stand rejected as being obvious over Stoecker in view of Ishibashi et al. and Riedl;
- Claim 9 stands rejected as being obvious over *Stoecker* over *Ishibashi et al.* and further in view of *Artzberger*;
- Claims 1-6, 8, 13, and 15-17 stand rejected as being unpatentable over *Riedl* in view of *Crum et al.*;
- Claims 10-12 stand rejected as being unpatentable over Riedl in view of
 Crum et al. and further in view of Sutherland;

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- Claim 7, 14, and 18 stand rejected as being obvious over *Riedl* in view of *Crum et al.* and further in view of *Garnjost*; and
- Claim 9 stands rejected as being unpatentable over *Riedl* in view of *Crum* et al. and further in view of *Artzberger*.

These rejections are respectfully traversed.

1. Recapitulation of the Invention

Referring to the drawings by way of explanation, the invention relates to an improved system for controlling the operation of a compaction plate machine (often known as a "vibratory plate machine") so as to reduce operator fatigue. As should be apparent from Section A above, compaction plate machines are well known that can be both controlled directionally (i.e., for and aft) and steered (i.e., left or right) remotely from the operator by manipulation of buttons or control handles. As explained on page 1 of the present application, the operator of prior machines must activate the machine's positioning unit by pressing buttons on the remote control and pushing buttons on the guide handle at the same time. This simultaneous operation requires a large amount of force because the guide handle of the prior remote controlled machine is much shorter than the center guide post of the prior non-remote controlled machine such as the Wacker DPU 7060 machine described above. In addition, because the operator mush simultaneously activate other operator elements such as control sticks, push buttons, or the like, he can only hold the machine's guide handle with one hand. This type of operation is very strenuous for the operator.

The invention overcomes this problem in a remarkably simple and effective manner that permits an operator to activate the positioning unit of a compaction machine in a simpler and less fatiguing manner than in prior machines. Specifically, the system is servo controlled

¹ This Section B(1) generally describes the state of the art and applicant's contribution to it. It is not intended to specifically distinguish the claims from the prior art. That task is performed in Section B(2) below.

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manipulated by an operator element, such as a joystick or a pair of levers, can be manipulated by an operator to generate a control command that is used to electronically activate the positioning unit. Hence, in the case of a machine having an operator element in the form of two control levers 8, an operator could push both levers forwardly to command the machine travel straight ahead, pull both levers rearwardly to command the machine travel backward, or push the levers in opposite directions to command the machine to effect a left hand or right hand turn. A sensor unit 11, such as a Hall Effect sensor or a proximity switch, senses the position of the control levers 8 and converts that signal to an electrical signal. That signal is then fed to a hydraulic system controller that controls electromagnetic valves to shift the phase relationship of the shafts 1, 2 and the eccentric weights 3, 4 of the machine's oscillator to effect the desired steering movement in a manner that is, *per se*, well known. Hence, there is no need to simultaneously press buttons on a remote control unit and push buttons on a guide handle. The operator can instead hold onto the guide handle 7 with both hands during all phases of steering.

As will now be detailed, a device of this type is amply recited in each of the independent claims 1 and 13 is neither disclosed nor suggested by any combination of the prior art cited by the Examiner.

2. <u>Traversal of the Rejections</u>

a. Rejections Based on Waschulewski in View of Crum et al.

The Examiner states that the *Waschulewski* reference discloses a soil compacting device that includes an oscillator, and at least one moving operator element (60) to control the positioning unit (36). The Examiner goes on to admit that *Waschulewski* does not disclose using a position sensor in a servo arrangement. Nevertheless, the Examiner states that *Crum*

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et al. teaches a handle bar mounted controller for powered machinery, and thus concludes that it would have been obvious to one of ordinary skill in the art to provide the soil compactor of Waschulewski, with the position sensor arrangement of Crum et al. Applicant respectfully disagrees.

Initially, applicant disagrees that the Bowden cable 60 of *Waschulewski* provides a teaching of the operator element of the claimed type. An operator element, by definition, is configured to be engaged by the operator. The claimed operator element is configured to both steer the soil compaction device and control its direction of travel. This is in contrast to the relatively complex *Waschulewski* Bowden cable 60, which is a downstream part of a complex shifting device that provides a mechanical link which, through manipulation by the user, is used to only shift the compactor. It *cannot* steer the compactor. Shifting forces must be generated by the operator and transmitted to the Bowden cable by some unspecified operator-manipulated structure. Those mechanical forces are then transmitted mechanically to the eccentric to effect a shift operation. As such, *Waschulewski* does not teach the operator element of claim 1.

In addition, although *Crum et al.* teach a handle bar mounted controller, integrating the *Crum et al.* controller with the Bowden cable arrangement of *Waschulewski* would not yield the present invention. Incorporating the controller of *Crum et al.* in the *Waschulewski* compactor would render the complex shifting arrangement/Bowden cable coupled to a positioning device unnecessary. In other words, the structure in *Waschulewski* that the Examiner contends is the operator element (the Bowden cable coupled to further structure to provide corresponding movement of the compactor) would no longer be present in such a hypothetical combination. Therefore, the applied references would not produce the claimed

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combination. Therefore, applicant respectfully contends that the combination of claim 1 is not obvious in view of the teachings of *Waschulewski* and *Crum et al*.

Moreover in this regard, the motivation to combine these references must come from the references themselves. Clearly, in addition to the fact that there is no explicit motivation provided by the references themselves, there was no motivation to combine these references at all, as doing so would require eliminating critical structure from the apparatus of the primary reference *Waschulewski*, namely, portions of the complex shifting arrangement including the Bowden cable. In other words, a complete re-design of the *Waschulewski* compactor would be required, and the resulting product would not include an "operator element" as defined by the rejected claims.

Finally, and further supporting applicant's argument regarding lack of motivation to combine, applicant contends that the combination including the *Crum et al.* teaching is inappropriate as *Crum et al.* is non-analogous art. *Crum et al.* is directed to a *throttle mechanism* that is employed in a system, such as a jet-ski, that requires some sort of controller to perform the desired operation, i.e., controlling a power source. All of *Crum's* teachings revolve around a throttle control. Throttle controls of the type disclosed in *Crum et al.* are very simple. They require nothing more than twisting of a twist grip for their implementation. The degree of throttle movement is proportional to the stroke of the twist grip. These teachings cannot be logically applied to a much more complex steering and propulsion control system of the type employed by a vibratory plate compactor. Hence, even if one were to combine Waschulewski and *Crum et al.* (against the clear teachings of the references), the resulting system would only shift the direction of movement of the vibration plate upon manipulation of some unspecified operator control. It would not both steer and shift the machine.

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The Examiner responds to these arguments by arguing that it is inherent to the teachings of *Waschulewski* that the disclosed Bowden cable 60 must be directed to some type of undisclosed operator element such as a joystick, to which the operator element of the present application is allegedly limited.² The Examiner is correct in that some operator element, probably a lever, is manipulated in *Waschulewski* to translate the Bowden cable. However, the resultant control is still purely mechanical, with the operator imposed manipulation of *Waschulewski's* undisclosed operator element physically translating the Bowden cable to affect the described operation. Applicant stands by its position that there is no suggestion in the prior art to use the claimed sensor *in combination with* such a Bowden cable because a servo controlled system would lack the need for a Bowden cable. The Examiner has *not* proposed replacing the Bowden cable with an electronic connection in his rejection.

Finally, the Examiner responds to applicant's non-analogous art argument by stating that *Crum et al.* is reasonably pertinent to the particular problem with which the applicant is concerned because it and the invention are both allegedly concerned with improving the efficiency of a machine by providing an electronic control circuit comprising a Hall Effect sensor. The Examiner has broadly over characterized the problem addressed by the invention. That problem, namely the need to permit the operator of a vibration plate to shift and steer the machine without having to release a control handle with one hand and without generating fatigue, is in no way suggested by *Crum et al.* Applicant therefore stands by his position in this regard. Each of the independent claims 1 and 13, and all claims dependent

² The Examiner's statement regarding the limitation of the claimed operator element to a joystick is incorrect both as a matter of law and a matter of fact. The claims are not written in means-plus-function format and, accordingly, cannot be construed to be limited to the disclosed structures corresponding to the claimed elements

or equivalents of those structures. In addition, a joystick is not the only device disclosed as being capable of performing the functions of the operator element. The embodiment *shown* in the drawings includes two independently operating handles 8. See, e.g., FIG. 2, and page 5, line 31 through page 6, line 1 of the present

application.

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therefrom, are believed to be allowable over *Waschulewski*, considered either alone or in combination with *Crum et al*.

b. Rejections Based on Stoecker in View of Ishibashi et al.

Next, with respect to the Examiner's rejection of claims 1-5 and 8 as being unpatentable over Stoecker in view of Ishibashi et al., the Examiner states that Stoecker discloses an operating element in the form of handle 16 to control a positioning unit at 93, 111, and goes on to conclude that it would have been obvious to one of ordinary skill in the art to combine the Stoecker compactor with the position sensor of Ishibashi et al. Applicant respectfully disagrees. Similar to our previous argument with respect to Waschulewski, the handle 16 of the Stoecker compactor performs physical work to steer the compactor in contrast to the operator element of the present invention. The handle 16 itself lacks the capability of either shifting or steering the machine. Shifting is instead performed by manipulating a separate shift lever 93 by kicking a kick plate 116. As with Washulewski, manual actuation of the lever 93 through the kick plate 116 mechanically shifts the machine's linkage to change its direction of travel. As with Washulewski, steering is performed purely manually. Moreover, in view of this fact, there was no motivation or suggestion in the references to combine the sensor of Ishibashi et al. with the Stoecker compactor as the combination would not yield the present invention as defined in the rejected claims. Incorporating the Ishibashi et al. teaching in the Stoecker device would render the kick plate 116 useless. In other words, the combination would not include an "operator element" operable as required by claim 1, and the combination therefore would not provide a teaching of all the limitations of the rejected claims. Even if one were to replace the kick plate with some sort of servo controller (of which many are undoubtedly known for unrelated applications), replacing the kick plate 116 with a servo controller would not produce the

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claimed invention because the resulting device would merely shift Stoecker's tamper, it would not steer it.

Applicant replies to the Examiner's rebuttal arguments set forth on pages 17-19 of the Office Action, as follows:

First, the Examiner's nitpicking regarding applicant's "easily positionable" characterization of the operator element misses the point. The main point is that *Stoecker's* machine is steered manually by providing direct physical steering forces to a handle and lacks any mechanism whatsoever for adjusting the relationship of its exciter shafts or otherwise effecting a servo-controlled steering operation of the type claimed. It therefore cannot be steered easily. Hence, providing a sensor that detects the position of a manually manipulated operator element and that produces a corresponding steering command signal would serve no effect. There would be nothing to control in order to steer the machine. The operator would still have to steer the machine manually. To render the machine steerable in the manner claimed would require modifications to *Stoecker's* machine not addressed in the Examiner's Office Action. Having failed to address this difference between *Stoecker* and the invention, the Examiner has failed to established a *prima facie* showing of obviousness.

The Examiner also improperly stated that applicant's arguments fail to comply with 37 CFR §1.11(b) because they allegedly did not tie the argument to the claims. Applicant disagrees. Applicant specifically stated that the handle 16 of *Stoecker* lacks the capability of either shifting or steering the machine. Applicant further stated that steering is performed manually in *Stoecker*. The applicant still further stated that combining the references would not produce a device capable of steering *Stoecker's* tamper. See pages 10 and 11 of the response. All of these arguments clearly were made with reference to the requirement in claim 1 that a sensor unit must determine the position of the operator element "and produce a

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corresponding signal to control the positioning unit in order to steer the soil compaction device and to control the direction of soil compaction device travel." Applicant did not expressly quote this language at this precise location in his response because he was under no obligation to do so. The correspondence between these arguments and the claim language was clear.

The Examiner also contends that the applicant attacked the references individually rather than in combination. Applicant disagrees. He argued that a material element of the claimed invention that the Examiner alleged was met by the primary reference to *Stoecker* in fact was not suggested by *Ishibashi et ai*. This alone is sufficient to traverse a rejection based on obviousness as failing to provide the required *prima facie* showing. In addition, applicant specifically argued that there as no motivation to combine the references in the manner proposed by the Examiner and that any conceivable combination of the references would not have produced the claimed invention. See lines 1-11 of page 7 of the response.

Applicant wishes to make one final point with regard to the Examiner's assertions regarding applicant's failure to comply with 37 CFR 1.111(b). Nothing in the rules requires that an applicant always must specifically refer to specific claim language when traversing a rejection based on obviousness. Part of the Examiner's *prima facie* burden carries with it the burden of establishing a motivation to combine the references in the manner proposed.

MPEP §2143.01. Where, as here, the applicant can demonstrate that the Examiner has failed to meet that burden -- be it because the references teach away from the proposed combination, because one or both of the references are non-analogous art, or some other reason entirely -- the applicant has fulfilled his obligations under Rule 111(b). Thus, the rejection of claims 1, 3-5, and 8 over *Stoecker* in view of *Ishibashi et al.* is improper and should be withdrawn.

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The rejection of the dependent claims 2, 10, and 11 based further on *Riedl* is respectfully traversed because that reference fails to cure the above-noted deficiencies in *Stoecker* and *Ishibashi et al.*, i.e., that is, it does not suggest modifying *Stoecker* to permit an operator to both steer a compaction plate machine and control its direction of travel using a sensor to detect movement of a system of levers or some other manually manipulated operator element and that generates a signal used to control a positioning unit in order to both steer a soil compaction device and to control its direction of travel. Specific deficiencies of *Riedl* are discussed in more detail in Section B(2)(c) below.

The rejection of the claim 9 over *Stoecker* in view of *Ishibashi et al.* and *Artzberger* is also traversed. The *Artzberger* patent discloses the only system cited by the Examiner that both steers a machine of anything remotely resembling the claimed type and controls its direction of travel. However, it discloses the same sort of remote control that is present in the prior art – albeit with a different type of controlled unit. It in no way suggests the use of a sensor to detect the position of an operator element *on the machine* to control the machine in the manner recited in claims 1 and 13 and discussed at length above.

C. Rejections Based on *Riedl* in View of *Crum et al.*

The rejection of claims 1-6, 8, 13, and 15-17 as being obvious over *Riedl* in view of *Crum et al.* is traversed for much the same reason as the corresponding rejection of *Stoecker* in view of *Crum et al.* is traversed. There is no disclosure in *Riedl* of adjusting the phase relationships of shafts and/or eccentric weights to effect side to side or curvilinear steering of the type required by both claims 1 and 13. In addition, as in other prior machines, the phase adjustment that *is* achieved is achieved purely hydraulically through operation of a hydraulic controller 12. *Riedl* is even less relevant than *Stoecker* in this regard because *Riedl*, like

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Crum et al., is capable only of one type of adjustment to its system. That is, it can operate the handle 13 in one direction only through an increase or decrease the pressure in chamber 12, just as Crum et al. can move its twist grip in one direction only (i.e., rotation about a single axis) to increase or decrease an acceleration command. Hence, even if Crum et al. were analogous art (which it is not), it at best would have suggested replacing the direct hydraulic connection of the device 12 of Riedl to Riedl's housing 1 with an indirect connection in which movement of the lever 13 is detected and some type of servo device is used to increase or decrease the hydraulic pressure in chamber 10. While the resulting system might conceivably alter the phase of eccentric weights, it would do so only to shift the direction of travel from forward to reverse and could not alter that phase in a manner that results in side to side steering. The resulting machine therefore would not meet the limitations of claims 1 and 13. Withdrawal of the rejection therefore is believed to be in order and is respectfully requested.

The rejections of the remaining claims over *Riedl* in view of *Crum et al.* and various combinations of *Sutherland*, *Garnjost*, and *Artzberger*, are respectfully traversed because none of the tertiary references cures the base deficiency of *Riedl* and *Crum et al.*

For instance, with respect to claim 14, *Garnjost* does not (contrary to the Examiner's assertions) disclose multiple control levers as claimed. It merely discloses unidentified "means" for individually controlling the angular position of a plurality of rotating masses. More importantly, the masses disclosed in *Garnjost* are used for aircraft turbo-fan vibration suppression rather than to generate vibrations in a compaction plate. Their positions are adjusted to maximize vibration suppression rather than to propel or steer a machine. The two systems are so dramatically different from one another in structure, function, and result that

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applicant fails to see how *Garnjost* could suggest *any* modification to *Riedl*.³ The *specific* modification proposed by the Examiner, i.e., a two independently operable handles mounted on a guide handle, clearly is suggested only by the Examiner's improper hindsight reconstruction of the invention based on applicant's own disclosure.

The Artzberger patent discloses the only system cited by the Examiner that both steers a machine of anything remotely resembling the claimed type and controls its direction of travel. However, as discussed above, it merely discloses the same sort of remote control that is present in the prior art – albeit with a different type of controlled unit. It in no way suggests the use of a sensor to detect the position of an operator element on the machine to control the machine in the manner recited in claims 1 and 13 and discussed at length above.

In summary, it is axiomatic that the motivation to combine prior art references must come from the references themselves. In view of the structures *Waschulewski, Stoecker*, and *Riedl* compaction plates, there would be no motivation to include such a position sensor as disclosed in *Crum et al.* or *Ishibashi et al.* with either of these devices. As a result, claims 1 and 13 and all claims dependent therefrom define over the cited references. An indication to his effect is respectfully requested. Should the Examiner have any additional concerns or wish to discuss the above for any reason, he is invited to contact the undersigned at the number appearing blow.

³ In fact, because it relates to a different field of endeavor and is not even remotely concerned with the problems addressed by the present invention, *Garnjost* clearly constitutes non-analogous art that should not even be considered when evaluating the alleged obviousness of the claimed invention.

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No fees are believed to be payable with the submission of this response. However, the Director is authorized to charge any fees associated with this or any other communication, or credit any overpayment, to Deposit Account No. 50-1170.

Respectfully submitted,

Timothy E. Newholm Registration No. 34,400

Dated: June18, 2003

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